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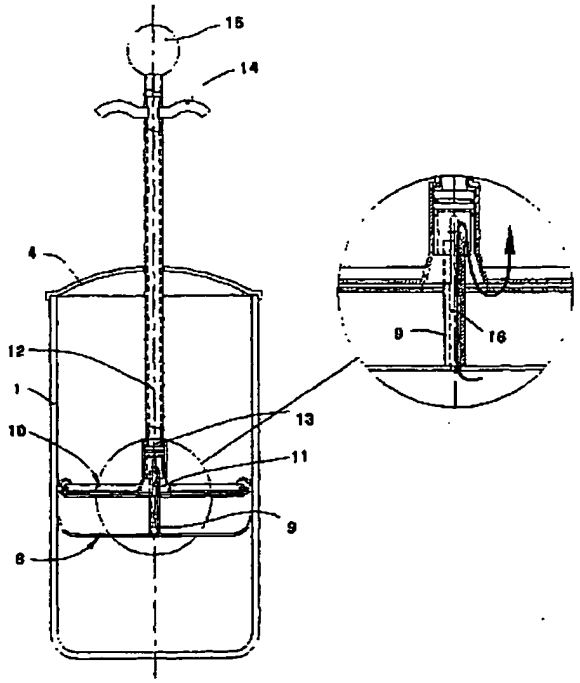
(54) Title: PLUNGER FILTER INFUSION DEVICE




(57) Abstract: Press filter device for the preparing, brewing or making e.g. coffee or tea according to the principle where a tasting substance, e.g. instant coffee or tea leaves and a liquid are dosed into a jug or pot (1), followed by a filtration process during which a filter piston (2; 10) is pressed through the liquid in a movement directed to the bottom of the pot, where the mainly dry remanence (waste product) becomes included in a space limited by the inner surface of the pot, the filter piston (2; 10) and a loose inserted underpiston or reception bowl (5; 9) arranged at the inner bottom of the pot, said reception bowl preferably being perforated and which in the lower position of the filter piston can be connected mechanically with the piston (2; 10) by means of a rigid, centrally arranged connection element (6; 9), wherein a canal or conduit is provided through the rigid centrally arranged connecting element (6; 9) on the bowl (5; 8) for equalizing the pressure between the lower side of the bowl (5; 8) and the upper side of the remanence deposited in the bowl, so that the vacuum arising below the bowl by the pulling up thereof after the compression of the remanence in the bowl by means of the filter piston, will not need to be equalized only by the taking in of air along the periphery of the bowl or through the tightly compressed remanence, but the equalization will be further promoted by the air flow through the centrally arranged pressure equalization canal. Thus, completely tight or imperforated and easily cleanable bowls can be used and their pulling out from the pots will not be more complicated than if the known perforated bowl had been used.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**
— *with international search report*

**PLUNGER FILTER INFUSION DEVICE**

The invention relates to a plunge-filter beverage infuser, alså named a cafetière á piston, French press coffee maker and a filter piston infusion appliance, hereinafter called a press filter device, for the preparing, brewing or making e.g. coffee or tea according to the principle where a tasting substance, e.g. instant coffee or tea leaves and a liquid, e.g. hot or boiling water or an alcoholic beverage are dosed into a jug or pot, followed by a filtration process during which a filter piston or filter piston is pressed through the liquid in a movement directed to the bottom of the pot, where the mainly dry remanence becomes included in a space limited by the inner surface of the pot, the filter piston and a loose inserted underpiston or reception bowl arranged at the inner bottom of the pot, said reception bowl preferably being perforated and which in the lower position of the filter piston can be connected mechanically with the piston by means of a rigid, centrally arranged connection element.

Such press filter devices are used in private households or in restaurants.

DE-PS 3432289 discloses such a press filter device with a detachable reception bowl arranged in the bottom of the pot. Said bowl is made of a heat resistant plastic material. It is a drawback by this construction that the reception bowl during its pulling up movement and connected to the filter piston is acting as a piston in a vacuum pump, whereby a vacuum is formed between the reception bowl and the bottom of the pot, said vacuum being proportional with the force used for pulling up the filter piston. Thus, this pulling up takes place rather slowly.

It has been attempted to eliminate the drawback by said press filter device by the construction known from US-PS 5,979,299 wherein the reception bowl has a perforated bottom and wall with which the filter piston may engage after the filtration operation. At this time the remanence is compressed in the reception bowl and forms a relatively dense filter

cake of a cemented substance which during the pulling up of the reception bowl also acts as a piston in a vacuum pump whereby the vacuum will delay and complicate a quick pulling up, even if alle the liquid in the pot has been poured out.

The press filter device according to the invention is characterized by a conduit or canal for pressure equalization between the lower side of the reception bowl and the upper side of the remanence deposited on the reception bowl, said canal is preferably arranged through the rigid and centrally arranged connection element on the reception bowl. Thus, the above drawbacks are eliminated since a canal for the equalization of the pressure difference conducts air and/or liquid between the lower side of the bowl and the upper side of said filter cake, i.e. the air/liquid avoids getting through the filter cake, so that the pulling up of the filter piston along with the remanence in the bowl can take place with no significant obstruction.

This embodiment will be described in more detail in connection with the measures mentioned in claim 2.

Claim 3 describes in more detail an embodiment corresponding to the device known from DE-PS 3432289 which may be improved by the present invention although the bowl is air tight, so that the vacuum arising below the bowl by the pulling up thereof after the compression of the remanence in the bowl by means of the filter piston, will not need to be equalized only by the taking in of air along the periphery of the bowl or through the tightly compressed remanence, but the equalization will be further promoted by the air flow through the centrally arranged pressure equalization canal. Thus, completely tight or imperforated and easily cleanable bowls can be used and their pulling out from the pots will not be more complicated than if the known perforated bowl had been used.

The invention will now be described in more detail with reference to some embodiments. On the drawing:

Fig. 1 shows the press filter device in a basic form with a hollow center pin on the reception bowl,

Fig. 2 shows a press filter device according to fig. 1 with an operation rod for engaging and disengaging the filter piston with the connection element on the reception bowl, and Fig. 3 shows the press filter device according to Fig. 2 but with a part thereof at an enlarged scale showing the connection elements with the pressure equalizing canal and flow direction and route for the equalization which is opposite to the direction of the pressure equalization air.

In its basic form the press filter device is designed as shown on Fig. 1 and consists of a pot 1 of e.g. glas or metal, a filter piston 2 fitting predominantly tightly to the inner surface of the pot and comprising a perforated metal sheet, a filter sheet of e.g. fine mesh metal tissue and provided with a piston rod 3 preferably of metal. This piston rod 3 extends through the lid 4 of the pot 1, said lid being e.g. of plastic and shaped so that it centers the piston rod with respect to the pot, said centering along with the centering of the filter piston controls the movement of the filter piston so that its center axis is kept essentially coincident with the longitudinal axis of the pot. Furthermore, a loosely inserted reception bowl 5 is arranged in the pot, said bowl predominantly fitting tightly to the inner cylindrical surface of the pot and manufactured from e.g. perforated metal sheet and provided with at least one connecting elements 6 each for connection with a connecting element 7 on the filter piston, so that the filter piston and the reception bowl is interconnected when the filter piston by its activation is pushed through the liquid to its lower position in such a way that when the filter piston is pulled out or up from the pot for cleaning after use, also the reception bowl and consequently the remanence trapped between the piston and the bowl will be pulled out. The connecting element 6 may preferably be performed with a throughgoing bore for equalizing the pressure differences between the lower surface of the reception bowl and the upper surface of the remanence in the bowl which pressure equalizing will facilitate the pulling out of th piston and bowl for the

cleaning.

In its basic shape the connecting elements may, as shown in Fig. 1, comprise a rigid element 6 arranged centrally on the reception bowl and preferably made of metal with a thickening or larger outer diameter in the end facing the filter piston, said filter piston being provided with a flexible element 7 preferably made of metal and shaped so that the connection is established by the flexible element is pressed down over the thickening on the connecting element 6 of the reception bowl according to the same principle as a socalled snap lock, and detaching of the bowl from the filter piston may be done by means of a predominantly sidewise displacement of the bowl relatively to the filter piston after the pulling up or out of the bowl from the pot by means of the filter piston.

In an alternative embodiment shown in Fig. 2 the connecting elements may comprise a rigid element 9 arranged centrally on the bowl 8, said element preferably being of a cylindrical shape and secured to the surface facing the filter piston 10, said filter piston being provided with a connecting element shaped as a pair of tongues 11 which partly enclose the connecting element 9 arranged on the bowl when the filtration pistion is in its lower position, and which pair of tongues is shaped as a slotted conical insert which fit into the filter piston, said insert via a rod 13 arranged in the hollow piston rod 12 belonging to the filtration piston is connected with a handle 14 so that the pair of tongues 11 by an upward pull in the handle 14 when retaining the handle 15 on the piston rod of the filtration pistion clamp and engage around the connecting element 9 arranged on the bowl, whereby the bowl can be pulled out from the pot along with the filtration pistion. The surfaces on the connecting means 9 on the bowl and the pair of tongues 11 may advantageously be provided with one or more grooves or channels for increasing the pressure equalizing rate and the interconnecting engagement between said two connecting elements for pulling out of the piston and the bowl from the pot.

C l a i m s :

1. Press filter device for the preparing, brewing or making e.g. coffee or tea according to the principle where a tasting substance, e.g. instant coffee or tea leaves and a liquid are dosed into a jug or pot (1), followed by a filtration process during which a filter piston (2; 10) is pressed through the liquid in a movement directed to the bottom of the pot, where the mainly dry remanence (waste product) becomes included in a space limited by the inner surface of the pot, the filter piston (2; 10) and a loose inserted underpiston or reception bowl (5; 9) arranged at the inner bottom of the pot, said reception bowl preferably being perforated and which in the lower position of the filter piston can be connected mechanically with the piston (2; 10) by means of a rigid, centrally arranged connection element (6; 9),
c h a r a c t e r i z e d in that a canal or conduit is provided through the rigid centrally arranged connecting element (6; 9) on the bowl (5; 8) for equalizing the pressure between the lower side of the bowl (5; 8) and the upper side of the remanence deposited in the bowl.

2. Device according to claim 1, c h a r a c t e r i z e d in that the pressure equalizing canal of the connecting element (6; 9) has an outlet on the lower side of the bowl (5; 8) and extends so far up in the connecting element that the upper inlet of the other canal is located higher than the level corresponding to the upper surface of the remanence deposited in the bowl.

3. Device according to claim 1, c h a r a c t e r i z e d in that the reception bowl (5; 8) is mainly shaped with smooth surfaces which are only broken by each pressure equalizing canal.

4. Device according to claim 1, 2 and 3, c h a r a c - t e r i z e d in that detaching the bowl from the filter

piston after it has pulled out the bowl from the pot mainly is done by a displacement of the bowl crosswise or sidewise in relation to the filter piston.

5. Device according to claim 1, 2 or 3, c h a r a c - t e r i z e d in that a rod connection (13) extends through a hollow piston rod (12) firmly attached to the filter piston (10) for the activation of a pair of tongues into engagement with the rigid centrally secured connecting element (9), and that the engagement of the pair of tongues does not obstruct or prevent the pressure equalization through said canal.

6. Device according to claim 1, 2 or 3 and claim 5, c h a r a c t e r i z e d in that the pair of tongues are shaped as a slotted conical insert which fit into the filter piston and allowing the pressure equalization through said canal.

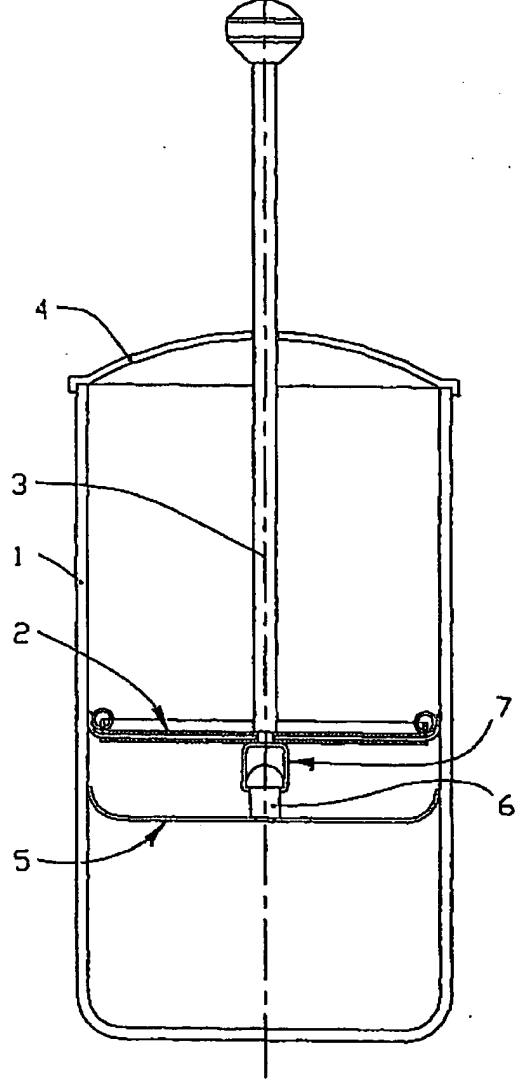


FIG. 1

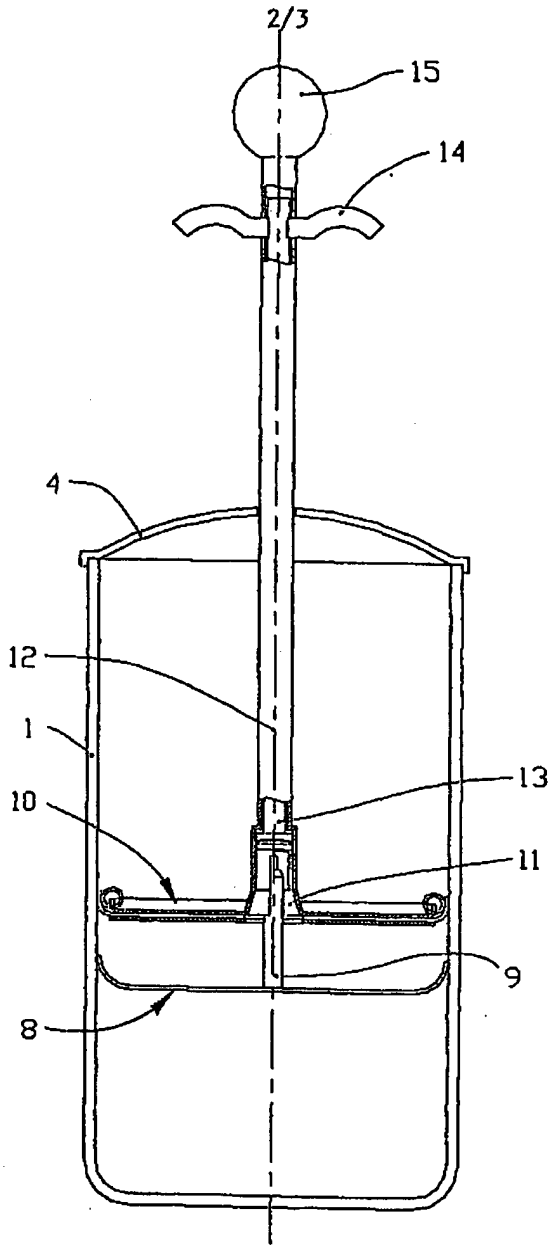


FIG. 2

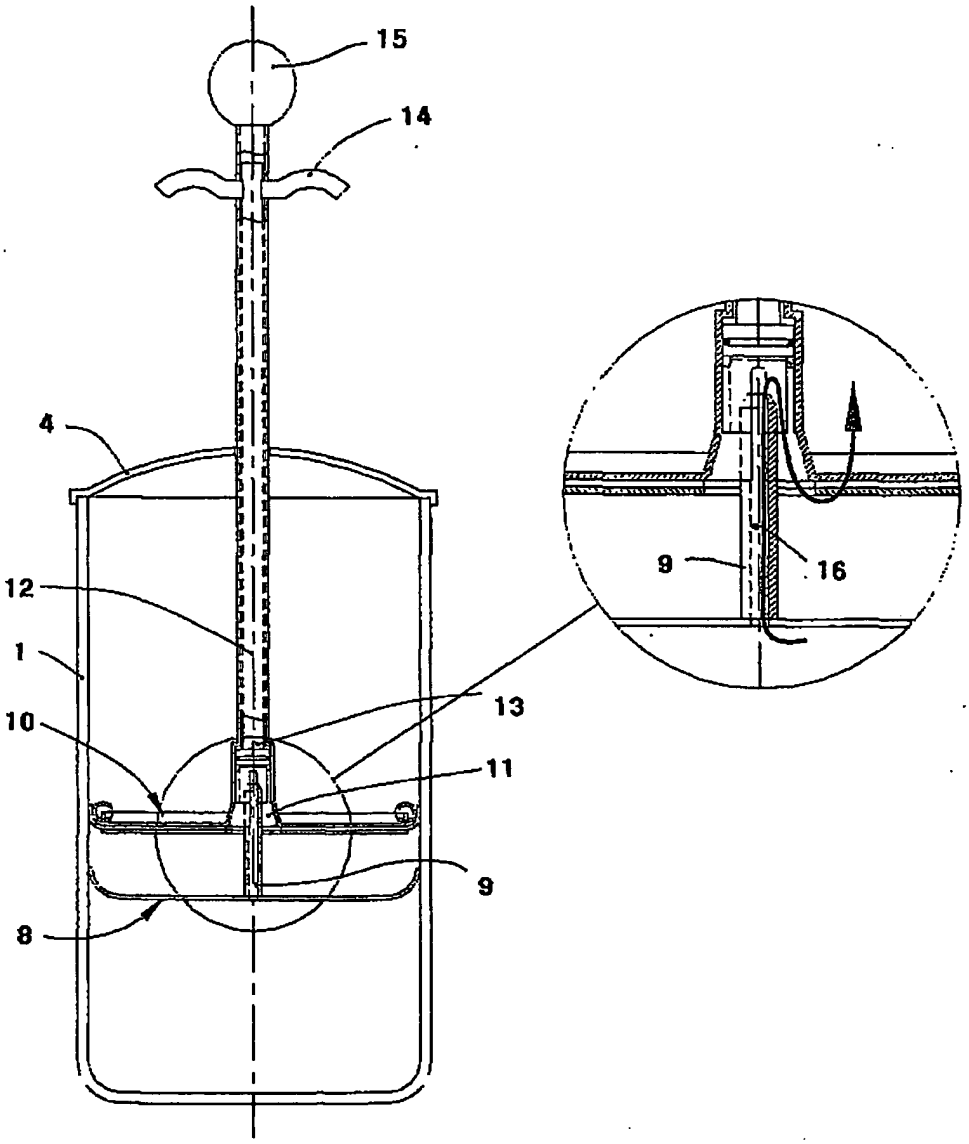


FIG. 3

# INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A47J 31/18, A47J 31/20, A47J 31/48
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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| A | EP 0615714 A1 (GENERAL FOOD LTD), 21 Sept 1994 (21.09.94), figures 1-10B, claims 1-16 | 1-6 |
| A | US 5544566 A (BERSTEN), 13 August 1996 (13.08.96), figures 1-10, claims 1-9 | 1-6 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 18 April 2002 | 30 -04- 2002 |
| Name and mailing address of the ISA/<br>Swedish Patent Office<br>Box 5055, S-102 42 STOCKHOLM<br>Facsimile No. +46 8 666 02 86 | Authorized officer<br>Agneta Änggård/EK<br>Telephone No. +46 8 782 25 00 |

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Information on patent family members

28/01/02

International application No.
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